WHAT IS CLAIMED IS:

1. A refractive projection objective for use in microlithography, comprising a lens arrangement with a system diaphragm, wherein the lens arrangement consists of lenses made exclusively of one and the same material, wherein the objective has an optical axis, an object field, an image field, and an image-side numerical aperture larger than 0.7, wherein a light bundle propagating through the objective is defined by said image field and said image-side numerical aperture and has within the objective a variable light-bundle diameter smaller than or equal to a maximum light-bundle diameter, and wherein in a length interval measured on the optical axis from the system diaphragm towards the object field and at least equaling said maximum light-bundle diameter, said variable light-bundle diameter exceeds 85% of said maximum light-bundle diameter.

2. The objective of claim 1, comprising a first waist arranged between two bulges and further comprising at least four doublets following said first waist relative to a direction of light propagation, each doublet consisting of a negative lens and a positive lens.

3. The objective of claim 2, comprising a second waist formed of two consecutive negative lenses arranged between two positive lenses, wherein each of said positive lenses has a convex lens surface facing towards said negative lenses.

4. The objective of claim 3, wherein the light-bundle diameter in the second waist exceeds 85% of the maximum light-bundle diameter.

5. The objective of claim 2, wherein in each of said doublets the negative lens immediately follows the positive lens relative to said direction of light propagation.

6. The objective of claim 2, wherein each of said doublets has a respective average lens diameter between the positive lens and the negative lens of said doublet, and wherein mutually facing lens surfaces of the positive lens and the negative lens of each of said doublets are spaced from each other at a distance shorter than 10% of said respective average lens diameter.

7. The objective of claim 2, wherein in at least three of said doublets said positive lens and said negative lens have mutually facing lens surfaces spaced less than 10 mm from each other.

8. The objective of claim 1, wherein the first two of the lenses relative to a direction of light propagation have a negative refractive power and are curved towards said object field.

9. The objective of claim 2, wherein the first waist consists of three negative lenses.

10. The objective of claim 1, wherein the first three of the lenses relative to a direction of light propagation have a negative refractive power.

11. A microlithography projection system comprising the objective of claim 1.

12. A method of manufacturing a component comprising a microstructure on a substrate, with the steps

of:

- applying a light-sensitive coating to the substrate;
- exposing the light-sensitive coating to ultraviolet laser light by means of a projection system and a mask of the microstructure; and
- developing the light-sensitive coating, whereby the microstructure is formed on the substrate;

wherein the projection system comprises the objective of claim 1.

13. A refractive projection objective for use in microlithography, comprising a lens arrangement with a system diaphragm, wherein the lens arrangement consists of lenses made exclusively of one and the same material, wherein each of the lenses has a diameter less than or equal to a maximum lens diameter, wherein the objective has an optical axis, an object field, an image field, and an image-side numerical aperture larger than 0.7, wherein a light bundle propagating through the objective is defined by said image field and said image-side numerical aperture and has within the objective a variable light-bundle diameter, and wherein in a length interval measured on the optical axis from the system diaphragm towards the object field and at

least equaling said maximum lens diameter, said variable light-bundle diameter exceeds 85% of said maximum lens diameter.

14. The objective of claim 13, comprising a first waist arranged between two bulges and further comprising at least four doublets following said first waist relative to a direction of light propagation, each doublet consisting of a negative lens and a positive lens.

15. The objective of claim 14, comprising a second waist formed of two consecutive negative lenses arranged between two positive lenses, wherein each of said positive lenses has a convex lens surface facing towards said negative lenses.

16. The objective of claim 15, wherein the light-bundle diameter in the second waist exceeds 85% of the maximum light-bundle diameter.

17. The objective of claim 14, wherein in each of said doublets the negative lens immediately follows the positive lens relative to said direction of light

propagation.

18. The objective of claim 14, wherein each of said doublets has a respective average lens diameter between the positive lens and the negative lens of said doublet, and wherein mutually facing lens surfaces of the positive lens and the negative lens of each of said doublets are spaced from each other at a distance shorter than 10% of said respective average lens diameter.

19. The objective of claim 14, wherein in at least three of said doublets said positive lens and said negative lens have mutually facing lens surfaces spaced less than 10 mm from each other.

20. The objective of claim 13, wherein the first two of the lenses relative to a direction of light propagation have a negative refractive power and are curved towards said object field.

21. The objective of claim 14, wherein the first waist consists of three negative lenses.

22. The objective of claim 13, wherein the first three of the lenses relative to a direction of light propagation have a negative refractive power.

23. A microlithography projection system comprising the objective of claim 13.

24. A method of manufacturing a component comprising a microstructure on a substrate, with the steps of:

- applying a light-sensitive coating to the substrate;
- exposing the light-sensitive coating to ultraviolet laser light by means of a projection system and a mask of the microstructure; and
- developing the light-sensitive coating, whereby the microstructure is formed on the substrate;

wherein the projection system comprises the objective of claim 13.

25. A refractive projection objective for use in microlithography, comprising a lens arrangement that consists of lenses made exclusively of one and the same material, wherein said objective has a numerical aperture of

at least 0.8 and is configured for light of a wavelength shorter than 300 nm within a defined bandwidth of $\Delta\lambda$, and wherein the objective is characterized by a characteristic index KCHL defined as

$$KCHL = \frac{CHL[nm]}{\Delta\lambda[nm] * (\frac{\Delta n}{n-1}) * y`\max[nm]}$$, wherein

CHL represents a longitudinal chromatic aberration and Y'max represents a maximum image field diameter of the objective, and wherein the characteristic index KCHL is less than or equal to 5.5.

26. The objective of claim 25, wherein the characteristic index KCHL is less than or equal to 5.0.

27. The objective of claim 26, wherein the characteristic index KCHL is less than or equal to 4.8.

28. A microlithography projection system comprising the objective of claim 25.

29. A method of manufacturing a component comprising a microstructure on a substrate, with the steps of:

- applying a light-sensitive coating to the substrate;
- exposing the light-sensitive coating to ultraviolet laser light by means of a projection system and a mask of the microstructure; and
- developing the light-sensitive coating, whereby the microstructure is formed on the substrate;

wherein the projection system comprises the objective of claim 25.

30. A refractive projection objective for use in microlithography, comprising a lens arrangement with a system diaphragm, wherein the lens arrangement is subdivided into three lens groups with a first lens group of positive refractive power forming a first bulge, followed by a second lens group of negative refractive power forming a waist, followed by a third lens group having an elongated configuration taking up 60% of a length measured from the object field to the image field, and wherein the system diaphragm is arranged in the third lens group.

31. A microlithography projection system comprising the objective of claim 30.

32. A method of manufacturing a component comprising a microstructure on a substrate, with the steps of:

- applying a light-sensitive coating to the substrate;
- exposing the light-sensitive coating to ultraviolet laser light by means of a projection system and a mask of the microstructure; and
- developing the light-sensitive coating, whereby the microstructure is formed on the substrate;

wherein the projection system comprises the objective of claim 30.